DOCUMENT RESUME

ED 103 977 88 EA 006 901

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TITLE Measurable Objectives for School Finance Reform: A Further Evaluation of the Illinois School Finance Reforms of 1973.
INSTITUTION Illinois State Univ., Normal.
SPONS AGENCY Bureau of Elementary and Secondary Education (DHEW/OE), Washington, D.C.
PUB DATE 1 Apr 75
NOTE 64p.; Paper presented at the Annual Meeting of the American Educational Association (60th, Washington, D.C., March 31-April 4, 1975)

EDRS PRICE MF-$0.76 HC-$3.32 PLUS POSTAGE
DESCRIPTORS *Educational Finance; Elementary Secondary Education; *Equalization Aid; Expenditure Per Student; *Finance Reform; Financial Policy; Fiscal Capacity; Income; Objectives; School Taxes; *State Aid; Statistics; *Tax Effort; Tax Rates
IDENTIFIERS District Power Equalization; Elementary Secondary Education Act Title III; ESEA Title III; Illinois

ABSTRACT

A 1973 Illinois school finance reform program initiated a guaranteed tax yield system that can also be considered a district power equalization system. This paper evaluates this reform according to four criteria: permissable variance, fiscal neutrality, reward for effort, and aid to urban areas. Emphasis is given to a discussion of legal and economic aspects of fiscal neutrality. The report includes limitations and qualifications of findings, but generally concludes that overall variation among districts has decreased, progress toward fiscal neutrality has been made, rewards for effort have increased, and large districts have received significant additional aid. Appended tables present the results and statistical methods. (DW)

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ED103977

MEASURABLE OBJECTIVES FOR SCHOOL FINANCE REFORM: A Further Evaluation of the Illinois School Finance Reforms of 1973

A paper presented to the 1975 Annual Meeting of the American Educational Research Association, Washington, D.C., April 1, 1975

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The authors express their appreciation to Daniel Jaw-Nan Hou, Fred Bradshaw, and Robert Pyle, Illinois Office of Education, for valuable assistance in this project.

Funds for a portion of this research were received from USOE contract OES-0-74-1581 under authority of Public Law 81-152, Title III Section 302 (4) (c). Additional resources were provided by the Graduate School, Illinois State University, and by the Department of Educational Administration, Illinois State University. The authors express their gratitude to all three sources for this support. Opinions stated herein do not necessarily reflect the official policy or position of the United States Office of Education nor does the cooperation of the Illinois Office of Education necessarily imply endorsement of these opinions.

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> By developing limited theories, testable and tested empirically, by being modest about them and tentative, we can, I think, make a small but effective contribution toward an ultimate science of society whose engineering applications will help regulate the complex civilization wrought by physical science and technology. In that spirit we shall try.
>
> --Samuel A. Stouffer
> Social Research to
> Test Ideas

Background

The K-12 finance reform activities of the last four years have begun to bear fruit, not only in new state laws relating to school finance, but also in important new contributions to the literature of this, one of the oldest areas of educational administration research. Last year alone, four books appeared which documented the progress of the post-Serrano financial reforms. These volumes will make a major contribution to conceptual development in the field.(1) In spite of their impressive contributions to theoretical development, however, none of these four new volumes focused primarily upon the difficult task of evaluating school finance reforms after these new laws have been enacted. This is understandable. Much of the time and effort of top school finance "experts" in the United States in the last four years has been heavily invested in helping state legislators

develop and indeed, in some cases, actually help pass the new K-12 finance reform laws. There is almost a common format for most of the state school finance studies of recent vintage. Such studies will almost always: (a) review and describe the current funding arrangements in a given state, (b) point out weaknesses in these institutional arrangements relative to criteria emerging from recent court decisions, (c) outline alternative arrangements, frequently in the form of new methods of state grants-in-aid, which, at least in the opinions of those who are doing the study, will more nearly meet the criteria implied in the recent litigation, and finally (d) provide computer simulations of these new proposals. A few such state studies even go so far as to provide first drafts of the proposed new legislation. There is nothing at all "wrong" with such investments of time and energy; in fact, such commitments are absolutely essential if educational research is to be regarded as "relevant" by state policy makers.(2) However, if educational finance is to develop as an important area of general social and economic policy then it is the position of this paper that such studies are "necessary but not sufficient."

The basic problem is that "goal" statements in educational finance, particularly those goal statements that emerge from the legislative process, are apt to be left at a very high level of verbal generalization. Nowhere is this more clearly demonstrated than in public law 93-380.(3) In section 801 the Congress of the United States proclaims: ". . . it to be the policy of the

United States of America that every citizen is entitled to an education to meet his or her full potential without financial barriers." The level of generalization is lowered only slightly in section 842 where it is required that states desiring federal aid in development of plans or programs for financial assistance to local districts develop a plan: "... (A) which is consistent with such standards as may be required by the fourteenth article of amendment of the Constitution and (B) the primary purpose of which is to achieve equality of educational opportunity for children in attendance at the schools of the local educational agencies of the State." The statute then leaves the evaluative criteria at this precariously high level of generalization and charges the United States Office of Education with the difficult task of developing more specific guidelines. Similar high-level goal statements could be taken from state legislation.

In our judgment a major responsibility of the researcher in K-12 finance must therefore be to recast and revise these very general goal statements into more operational, measurable, and ultimately, researchable terms. It is particularly important that this task be done soon and by several individuals. The consequences of not devoting resources to this matter are not pleasant to contemplate. If evaluative criteria are left at a high level of verbal generalization then state and federal courts cannot tell if their orders have, or have not, been obeyed. In fact, school finance cases may not even be

justiciable if the issues in question cannot be subjected to at least some very elementary form of measurement. State and federal legislators also cannot tell if their intent has, or has not, been violated. A greater danger may well exist on the legislative side than on the judicial side. Too often in educational finance, as in other areas of education legislation, there is a very great temptation to "pass a Christmas tree with a gift hung on it for everyone and then figure out the wiring later." Clear statements of public policy tend to become blurred in the necessary and unavoidable compromises that must always take place in the passage of any legislation. Without operational definitions of educational fiscal goals both the reforms and the reformers can get lost in a dense jungle of sheer opportunism. It is also difficult to see how any of the thinking behind the "management by objective" movement, so popular now at the local administrative levels, can be implemented at the state level of administration if those objectives are left imprecisely defined and essentially unmeasurable. Finally, professors of educational finance have a vested interest in this matter. A cumulative body of knowledge for them to "profess" is difficult, if not impossible to erect, unless the major concepts of the field are well grounded empirically, and amenable to measurement.

For the above reasons a recent offer of the Division of State Assistance, U.S. Office of Education, to help finance an evaluation of the 1973 K-12 finance reform in Illinois was

quickly accepted by a research team at Illinois State University. The information presented in this manuscript is an updating and revision of a report submitted earlier this year (1975) to the U.S. Office of Education. The two manuscripts are not identical, however. This version contains an analysis based on data for two years following the reform while the original report contained only data for the first year following the reform. We have also added some different methods of analysis to this document. However, much of the original analysis had to be eliminated in order to keep the paper within reasonable limits. Individuals who have a strong interest in these matters are therefore urged to examine both documents.(4)

No attempt will be made in this paper to delineate the exact nature of the 1973 reforms other than to say that a Strayer-Haig or "foundation" type program, which had been in existence in Illinois for forty-six years, was replaced with a "guaranteed tax yield" system which had been pioneered in Wisconsin and Utah. The Illinois reform can also be considered a "district power equalization" system if the DPE label can be used on those systems where no recapture of funds from the affluent districts takes place. The Illinois allocation reform of the summer of 1973 has many similarities and some differences with a reform carried out simultaneously in Michigan known as the "Bursley Act."(5) The reform was also similar in concept, though not in operational details, to recent reforms in the states of Kansas, Colorado, Maine, and Montana.(6)

Essentially, after 1973, more state funds are provided to districts in Illinois with higher tax rates, lower assessed valuations, and heavier concentrations of title one eligible pupils. Conversely, lower amounts of state aid are available to districts without these characteristics. The notion of using the ratio of compensatory education students in a district to the total student population in the district to establish a "variable" weighting for compensatory education has been suggested by a number of analysts.(7) To our knowledge, however, Illinois is the only state to have enacted this variable weighting into law. At the time of this writing the state of Missouri was giving serious consideration to such a procedure.(8) There are other important provisions in the new Illinois allocation system. For example, the DPE schedule operates only up to ceilings of $3.00 for K-12 districts, and $1.95 or $1.05 for the separate elementary and high school districts respectively. Flat grants are also available to affluent districts that do not qualify under the DPE schedule, and, has has been previously mentioned, there is no mandatory recapture of funds from wealthier districts. Perhaps the most controversial part of the Illinois reforms is a tax rollback that applies to districts receiving funds under the DPE schedule, essentially requiring them to work back to the levels of $3.00, $1.95, and $1.05. Michigan has no such rollback provision in its reform. Readers interested in the details of the new law are directed to valuable descriptions and analysis provided elsewhere by Ben C.

Hubbard and Fred Bradshaw.(9)

The Evaluative Criteria and the Operational Definitions

Four criteria were selected for the evaluation of the Illinois 1973 reform. These were termed: "permissible variance," "fiscal neutrality," "reward for effort," and "aid to urban areas." It should be stressed that these are not the only criteria that could have been selected to evaluate the 1973 reform. For example, many will object to the fact that we did not specifically include a criterion based on the notion of "cost differentials for different student educational needs." A "needs" dimension is included, however, in one special version of the fiscal neutrality criterion, but it is true that we did not highlight the "needs" criterion. The state of Illinois has moved perhaps more cautiously than other states in the adoption of programatic cost differentials.(10) Cost differentials have for some time been included in the grant-in-aid formula for level of instruction--e.g., higher costs in high schools--and, as has been indicated, in 1973 weightings were added for compensatory education. Other student needs are presently taken care of by special purpose or categorical grants-in-aid. We shall describe each criterion in turn and indicate the nature of the measurements used to operationalize each criterion.

The first criterion labeled "permissible variance" rests upon the assumption that society through its instrumentalities

of courts and legislatures is willing to allow a certain amount of inequality in either the inputs of the educational process or in the outputs of that process. Absolute equality of expenditures, services, tax rates, and, ultimately, products, is not then desired according to this criterion. It is generally held, however, that a reduction in the variation of the above-mentioned school district characteristics is desirable.(11) There are several possible operationalizations of such a normative goal. The range, the difference between two percentiles such as the 90th and the 10th, the mean deviation, the standard deviation, all come to mind. Since previous research in school finance has used the "coefficient of variation," e.g., the standard deviation divided by the mean and multiplied by 100, that is the convention we have followed here.(12) Such a metric has the advantage of standardizing the measurements and hence can be used between states with quite different levels of expenditures and tax rates. It is important to note that this particular criterion focuses upon the entire distribution and not upon any portion of that distribution. Let us designate this approach "model A" of "permissible variance." In the Illinois evaluation we shall use it only with regard to expenditures and tax rates but, as we have discussed elsewhere,(13) the notion could also be applied to service levels, services provided, and ultimately to the outputs or products of the educational system.

Model B of the permissible variance criterion rests upon quite different normative judgments. The late Paul Mort and many others associated with him held that it was the lower end only of a distribution of expenditures that should concern educators and policy makers.(14) This school of thought generally maintains that it is necessary to allow some districts to have greater expenditure levels than other districts in order that they can function as "lighthouses" to guide the other school districts to higher quality levels of educational services. New innovations in these "lighthouse" districts supposedly would "trickle down" to the other less fortunate districts. The argument has also been advanced that only by allowing some districts to have expenditure levels that exceed others can one develop a "leverage" or "demonstration" effect in K-12 education.(15) This works essentially as a none too subtle form of blackmail. Appeals to local pride based on pointing to gaps between the level of services in one's own district, and the level of services in surrounding districts, have often worked to the advantage of both local boards and local teacher organizations, either separately or jointly. This general position has been recently restated in a publication by McLoone.(16)

Operationalization of "model B" requires a focus, not upon the entire distribution, but rather upon the distribution below the median expenditure or below some other arbitrary value. Essentially this is a "leveling up" notion which allows

and even encourages skewness in the expenditure distribution as long as the variation in the lower end of the distribution is reduced. In the USOE report we used the median expenditure in the state since this was a value extensively used by McLoone. However, in the work reported here we have selected the arbitrary figure of $1,260 per pupil and indicate the percentage of pupils and the percentage of districts below this figure. The $1,260 figure is the guaranteed expenditure level if the districts in Illinois levy the maximum tax rate allowed under the Illinois DPE schedule. An index can then be formed, similar to those used by McLoone, by dividing the total expenditure below $1,260 by the total expenditure plus the deviation below $1,260. If the index snows an increase through time then a "leveling up" has taken place. While both models "A" and "B" are operationalized by measurements of variation in a univariate distribution, there is a considerable difference between them in terms of underlying social and economic assumptions. Model "A" is obviously more egalitarian and model "B" more libertarian. The conflict between these ideological positions in school finance was aptly described some time ago by James.(17)

The criterion labeled "fiscal neutrality" arises from the recent litigation regarding the constitutionality of K-12 finance laws.(18) There is an increasing amount being written on this concept in legal, economic, and school finance circles. Some authors are supportive of this concept as a primary goal

of K-12 finance, some oppose it, and some have apparently not made up their minds as yet.(19) It is certainly much more complicated than any of the other criteria we have used to evaluate K-12 changes in Illinois. There are at least three aspects of the notion that deserve some discussion prior to outlining measurement procedures which will implement the criterion. First, one must realize that there is a rather marked departure here from assumptions about the purchase of other kinds of goods and services in the economy. We do not say to consumers that the purchase of their automobiles, their houses, their clothing, their food, etc., should not be a function of individual and/or family wealth. We may provide a "floor" under some of these purchases, but in general, we expect most demand functions in the private sector to be strongly determined by wealth. However, in this one portion of the public sector we have departed drastically and rather dramatically from a conventional "market" orientation. It is beyond the scope and mission of this paper to explore why we have chosen to place educational goods and services in this unique position. Two possibilities suggest themselves. One is that education is somehow "unique" among public services, and the older literature did, in fact, argue that such was the case.(20) The second is that it is not possible to treat education as purely a consumer good but rather as an allocation of funds that is partially consumption, but also partially investment in human capital formation. More recent literature maintains this latter

position.(21) Despite reservations by the more conservative economists, American society does seem to be moving toward a position which holds that the purchase of K-12 educational services should not be a function of local district wealth.(22) It is perhaps unfortunate that the term "neutrality" was chosen early in the school finance litigation, since this brings to mind the concept of tax neutrality. The kind of allocation system contemplated under most conceptualizations of fiscal neutrality is not at all neutral as far as taxes are concerned.

The second aspect of the fiscal neutrality criterion that needs discussion arises from the fact that there is nothing in the criterion which prevents the level of educational services from being a function of local willingness to tax, or a function of the differences between educational needs of school districts, or a function of cost-of-living differences between school districts, or, indeed, any reasonable and rational determinant of expenditures other than the specifically interdicted local district wealth. This leads to the dilemma that Stephen Barro has called the ex ante versus the ex post notions of fiscal neutrality. To use his own words:

> . . . one must choose between ex post and ex ante concepts of fiscal neutrality. The ex post interpretation is that the actual level of educational support must not correlate with wealth. On that basis, a system that resulted in both higher spending and higher tax effort in wealthy districts would not be acceptable. The ex ante formulation is that the ability of a district to support schools should not depend on wealth. This means only that a unit of effort must produce the same support everywhere.(23)

It is possible to argue therefore that the mere adoption of a system like that written into law in Illinois, Michigan, and other states in 1973 constitutes prima-facie evidence of the accomplishment of fiscal neutrality. This is to say, if two districts are willing to exert the same tax effort, they will be guaranteed the same expenditure up to the ceilings imposed in the laws of the particular states. Thus "access" to equal fiscal resources has been assured. However, what happens if the poorer districts prefer the lower tax rates and the wealthier districts prefer the higher tax rates? Should this situation prevail, then all "reward for local effort" schemes will tend to reinforce the existing tendency for expenditures to be a function of local wealth. The ex post position imposes a much more difficult test of whether there has, or has not, been a movement toward fiscal neutrality. This position holds that regardless of the pricing patterns and educational preferences of rich and poor districts, or regardless of anything else for that matter, expenditures must simply never be a function of local wealth. On the whole we tend to prefer the harder ex post position and have had that in mind throughout the Illinois evaluation study.

The third aspect of fiscal neutrality has to do with "fairness" in the distribution of shares of the available state and local dollars set aside for education. Viewed from this "fair share" perspective fiscal neutrality would appear to mean that rich students and poor students should have the same share

of state and local dollars available unless other non-wealth factors, such as local willingness to tax, or differences in the educational needs of the student population, prevent this from occurring. This is not a very radical notion. To the contrary, if stated without the clause above referring to different educational needs, it would allow no room for a "compensatory" idea of educational spending. There are many who hold that poor students should have, not the same share as the rich, but a greater share of the educational dollars spent on them, in order to attain more equality of educational output.(24) The advantage of this "fair share" aspect is that it leads one toward the kind of measurements used in the study of income distributions in the discipline of economics. In particular, it suggests the use of the Gini Index and the Lorenz Curve which we shall now discuss.

For the operationalization of fiscal neutrality we have also selected two models and shall again designate them "A" and "B." Model "A" utilizes the Gini coefficient or "coefficient of concentration" as it is sometimes called. As in previous research reported by Hickrod and his associates this index is based upon a bi-variate set of measurements rather than a univariate set of measurements.(25) That is, both wealth and expenditures (or alternately revenues) are used rather than expenditures alone. This usage is to be contrasted with the Gini applications made by McCloone, Michelson, and others which are based upon expenditures alone.(26) Since the Gini

coefficient has been used several different ways in recent school finance research it is necessary to ascertain in each piece of research just what kind of application has been made.(27) Basically what we have done in this bi-variate application is to rank the school districts from low to high upon some specification of wealth. In the Illinois evaluations we used property valuations per pupil, income per pupil, and a combination of the two resource measurements. Our experience working with this index suggests that one can get quite different values depending upon both (a) the specification of wealth used, and (b) the specification of pupils used; i.e., weighted versus unweighted, ADA versus ADM, etc. Once this wealth ranking of districts is completed a cumulative percentage distribution of pupils is then formed starting from the poorest districts and working to the top. A similar cumulative distribution is established for state and local revenues. The two cumulative percentage distributions (wealth and expenditures) are then plotted on an X-Y axis.

If the "fair share" idea, discussed above, actually prevailed in a given state the X-Y plot of the two cumulative percentages, wealth and state and local revenue, would be, in fact, a straight line. That is, the poorest 10 per cent of students would get 10 per cent of the available "pie" of state and local monies, the poorest 20 per cent would get 20 per cent, etc. A distribution of state and local funds would prevail that would be "neutral" of local resources and this is exactly what is necessary in any operational definition of fiscal neutrality.

The situation would be the same as a state of affairs in which the state raised all revenues and then distributed them back on a head count basis irrespective of local resources. One might therefore think of it as "full state funding" with flat grant distribution. However, previous research in Illinois plus our general knowledge of the conservative nature of state school finance systems in other states strongly suggests to us that this straight line is not the observed function formed by the plotting of the two cumulative percentage distributions. To the contrary, we believe that the plot of the two cumulative distributions will, in at least a number of states, form a curve which will depart from the "ideal" straight line. This curve of two cumulative percentage distributions (such plots are frequently referred to generically as Lorenz curves even though they have nothing to do with income distributions) can then serve as the graphic representation of the fiscal neutrality situation in a given state at a given time. Such graphic representations are in themselves useful for analytical studies. However, it is also helpful to have a numerical value which will describe the overall extent to which the curve departs from the "ideal" straight line. There are several ways of computing such a value, generally referred to as the Gini Index, Gini coefficient, or coefficient of concentration. Appendix A to this paper prepared by Ramesh Caudhari sets forth one possible calculation procedure. Readers interested in examining the computer program for such a calculation should address

themselves directly to the Illinois State University Computer Center.(28)

The conservative nature of the fiscal neutrality criterion is fully revealed by this type of operationalization. A truly compensatory notion of school finance would require that the poorest 10 per cent of the students ranked by wealth receive more than 10 per cent of the state plus local funds available for K-12 education. In other words, full state funding with flat grant distribution would not be an acceptable "ideal" situation to many in the school finance field. Furthermore, the operationalization thus far says nothing whatsoever about individual student needs. We can introduce the notion of differential needs, however, into the fiscal neutrality criterion. This can be done by using not ADA or ADM in the wealth per pupil axis, but rather wealth per weighted pupil, where the weights are derived from programatic cost differential studies.(29) If pupils have been previously weighted by cost differentials based on their different educational needs before the rest of the calculations are performed then we would have a situation in which the 10 per cent poorest pupils, now weighted by their educational needs, would be expected to receive 10 per cent of the state and local pie, the poorest 20 per cent, now weighted by their educational needs, 20 per cent, etc. This "expanded" definition of fiscal neutrality--one might call it, "fiscal neutrality with provision for differential needs"--would probably be more acceptable to many

analysts in school finance. Unfortunately, since these programatic cost differentials vary so much from state to state, and even from one time period to another within a given state, comparability would be a major problem. One might in fact never be able to use this expanded notion of fiscal neutrality in interstate comparisons. We elected nevertheless to take a small step in this direction in the Illinois evaluations by weighting students with compensatory educational needs prior to establishing the wealth per pupil measurements needed in the Gini calculation. Thus all our results reported to this date are stated both in terms of ADA, which we hope can be used for comparisons with other states, and in terms of TWADA, which is useful only in the Illinois context.

We do not wish to imply that there are no problems and no unanswered questions in the usage of this bi-variate Gini coefficient as an operational definition of the fiscal neutrality criterion. Quite to the contrary, a number of individuals, especially James N. Fox, John J. Callahan, and William H. Wilken, have raised a number of important points. For example, should there be a state in which the poorest X per cent of students do receive more than X per cent of state and local funds, e.g. a truly "compensatory" situation exists even <u>prior</u> to the application of federal funds, then the curve might well go above the line at least through a portion of the lower end of the wealth distribution. If the curve crosses the line once or more than once the interpretation of the Gini

coefficient as defined in Appendix A would be quite difficult, since there would be sign changes in the cross-multiplications. In cases where the curve crosses the line, the graph itself would probably be more important than the mathematical value. The possibility of this increases if federal funding is added to the expenditure side. In such cases the analyst had better look for a "bedsheet" plotter since ordinary plotting attachments to most computer equipment are not scaled to show small departures from the line. The bi-variate Gini technique also produces a curve which is not a smooth function but a rather irregular one. Thus while the Gini values can represent the overall departure from the line they are not representative of any given segment of the curve.

Throughout our Illinois evaluations we have tried to select measurements and procedures that would be helpful in interstate comparisons at some later point in time. There would appear to be some complications, however, in using the Gini coefficients in interstate comparisons. As set forth in Appendix A, the departure from fiscal neutrality is the <u>combined</u> effect of local resource disparities, plus local willingness to spend (local tax rate) differentials, plus the effects of the particular kind of grant-in-aid system used by a given state. In short, it is a wholeistic measurement. Under certain conditions this is not much of a limitation. For example, when investigating a single state, and especially where the research design calls for measurements taken only a year or two apart,

there is little reason to suppose that local resource disparities or even tax rate disparities will change drastically in a very short span of time. Hence it seems permissible to assume, as we did assume in the Illinois evaluations, that what we were observing in the changing Gini coefficients could be attributed to a rather drastic change in state aid systems. However, when operating over longer spans of time, or between states, that assumption would no longer be possible. Local resource disparity varies greatly between states, frequently being a direct function of the number of school districts in the state. Thus two different Gini values, in two different states, might be due more to the differences in local resource disparity than to any differences between the states in their grant-in-aid systems. Some method, therefore, is needed to "net out" the effect of local resource disparity, and local tax effort differences, if one wishes to try to get to the effects of the grant-in-aid system. Only by this "net" procedure would it be possible, for example, to study the fiscal neutrality situation in "foundation plan" states as opposed to "incentive grant" or DPE states. Appendix B, prepared by Thomas Wei-Chi Yang and Ramesh Chaudhari, makes an initial attempt at this "netting out" process. We hope this appendix will prove useful to those attempting to make interstate comparisons with the Gini Index.

While we tend to prefer the Gini coefficient and its attendent Lorenz curves as an operational definition of fiscal neutrality we would not wish to suggest that this is the only

operationalization of the fiscal neutrality concept that is possible. It is also possible that some of the problems previously mentioned in connection with the bi-variate Gini may prove more resistant to solution than now appears to be the case. Hence an alternative or "backup" measurement may be essential. A second operational definition of fiscal neutrality has been suggested by Michelson.(30) Michelson actually discusses this procedure under the label of "equalization," but, for reasons which we shall provide later, we no longer find "equalization" a very useful concept in school finance. In this operationalization of "fiscal neutrality" expenditures or revenues are regressed against wealth. Again the wealth specification could be property valuations, income, or some other approach to local fiscal capacity. The unit of analysis here is not students, as is the case in the applications we have been making of the Gini coefficients, but rather school districts. Presumably one could weight the school districts, but as Michelson describes it, the regression seems to be in terms of districts and hence the largest district in the state would have equal effect on the slope as the smallest school district. As with the two variable Gini, the desired or "ideal" value is zero, indicating, in this situation, a linear function that has no positive slope between wealth and expenditure. Although Michelson does not provide for this, it seems useful to put the measurements into some standard units if the intention is to eventually make interstate comparisons. We elected to use the logarithms of the

original numbers although some other transformation might also serve this purpose. It is possible that this log linear function also provides a better fit to the actual data than does the untransformed function but we did not explore this matter. The Michelson approach is here labeled model "B" of the fiscal neutrality criterion.

The third criterion has two possible formulations. One can refer to it either as "reward for effort" or "equal expenditure for equal effort." There may very well be more problems with this criterion than there are with fiscal neutrality. In the first place there is the major theoretical problem of whether one can ever really get a valid measurement of "effort" among school districts. Two districts having the same nominal tax rate, or even the same effective tax rate, might not have the same tax burden. This could happen if one of these districts was able to "export" most of its tax through shifting the burden to consumers in its shopping centers and through manufacturing enterprises located within its borders. This subject is covered especially well by Michelson.(31) Even if one is willing to overlook completely the complicated matter of final incidence of the property tax there are still complications. For example, it is quite likely that the "desired" function between tax rate and state and local revenues is not rectilinear at all. Benson and his colleagues recommend, for example, that DPE systems be curvilinear, rather than rectilinear.(32) The usual recommendation is that the higher

tax levels should not be provided with as strong a "reward for effort" as the lower tax levels. There is also the problem of whether it is the slope of the line that is of interest, or the goodness of fit around that slope. Presumably the slope would be the better operationalization of "reward for effort" since the interest is marginal in nature; that is, what the reward would be for greater effort. The goodness of fit, or the errors of estimate, would be a better operationalization of the notion of "equal expenditure for equal effort." The latter verbal formulation seems to imply that there be no residuals from a rectilinear function. In the Illinois evaluations we decided to use both. Therefore "model A" of this criterion is based on the regression coefficients and "model B" on the square of the product moment correlations. While our explorations with this criterion may be less satisfactory than with the first two criteria the concept of "effort" can by no means be ignored. The fact that eight or nine states now have grant-in-aid systems that feature varying degrees of "reward for effort" makes it imperative that we know much more about <u>which</u> districts are willing to exert <u>what</u> effort under <u>what</u> kinds of conditions. In our judgment neither the measurement of effort nor the determinants of effort have been paid adequate attention in school finance research.(33)

The fourth and final criterion is also debatable. With some reservations we tended to accept the arguments of many analysts that it was the urban areas of the state that needed

assistance more than the suburban or even the rural areas.(34) It was necessary then to construct a typology for classifying districts in Illinois as to urban-suburban-rural categories. The scheme we eventually adopted was a modification of the system used by school finance researchers at the University of Wisconsin.(35) City school districts are of two types in this system; "central city" districts and "independent city" districts. Central city districts are those districts serving the largest city in each of the standard metropolitan areas of the state as defined by the 1970 census of population and housing. Independent city districts are those school districts serving a city with a population of 10,000 or more in 1970, but not located within a standard metropolitan statistical area. These are the two categories of "urban" school districts. "Suburban" districts are also of two types. To qualify as a "suburban" district, a school district must be located within a standard metropolitan statistical area but not be the central city therein. The enrollment growth of these suburban districts was then calculated between 1964 and 1973. If the suburban school district was above the median in percentage increase of students it was designated a "rapid growth suburb" and if below the median a "low growth suburb." Finally, all school districts which were neither within a standard metropolitan statistical area nor were "independent cities," were designated "rural." The report prepared for USOE earlier this year contains a further analysis of rural districts by regions of the state

which is not reproduced here. In fact, our entire community type analysis has been reduced in this particular manuscript to only one table to save room for other matters.

As we have previously indicated we have seldom mentioned, and nowhere made use of, the concept of "equalization," either in this manuscript or in the longer USOE report. This may seem unusual in light of the fact that the concept has been widely used in the school finance field for decades and two of the authors of this paper previously wrote a monograph on the concept of "equalization."(36) We did not find the older concept of equalization of great utility in evaluating the Illinois K-12 grant-in-aid reforms. Many studies define "equalization" as simply the flow of state money to local school districts where that flow is inverse to some measure of local wealth, usually property valuations. Measurements are then made in terms of product moment correlations or regression slopes, and even occasionally in terms of Gini coefficients where shares of state aid are related to wealth in a bi-variate fashion.(37) This sort of investigation may still serve some purpose in that it is important to the legislature to know "who gets what," but there are other ways to answer that question.

The inadequacy of a simple relationship between state aid and wealth can be easily demonstrated. Assume two states, X and Y. Assume further that X is at 80 per cent state support and Y is only at 20 per cent state support. If Y, which provides very little state dollars for K-12 education, decides

nevertheless to distribute most of these limited state dollars to the poorest districts, it will appear to rank high on many conventional measurements of "equalization." Assume then that X, which provides a great many more state dollars for education, decides to spread its allocations among some of the wealthier districts as well as among the poorer districts. By simple bi-variate measurements between state funds and local district wealth, state X will rank low on "equalization." However, investigation of variance in expenditure per pupil (our first criterion) may well show that there is less variance in state X than there is in state Y because the higher level of state funding causes less dependence upon local property valuations. It is even plausible that state X may have moved much closer to fiscal neutrality, at least as we have defined it in the Illinois studies, than state Y even though the relationship between state funds and wealth shows less of a negative relationship for state X than for state Y. For these reasons we would suggest that prior studies which depend completely upon a simple state aid versus wealth conceptualization of "equalization" be rather critically examined before any major policy decisions are based upon the results. It appears to us that the profession might be well served by a temporary retirement of the concept of "equalization," and a much more careful use of the ubiquitous product moment correlation. To be entirely honest we are currently of the opinion that no index, associational measure, or any other statistic or mathematical

expression is completely satisfactory in evaluating the allocation patterns of K-12 state aid systems. It is just possible that the graphic methods used by McLure and others(38) may, in the long run, provide a more complete picture than any of the statistical or mathematical efforts. Unfortunately these graphic methods are cumbersome to use in making interstate comparisons and do not yield themselves to elegant empirical model building that seems de rigueur in present academic circles.

The Study Populations Used

No sampling was employed in this analysis. For all parts of the analysis in the study, except where income data is employed, the entire population of 501 elementary districts, 143 high school districts, and 436 unit districts in 1972-73 was employed. For 1973-74, the 476 elementary districts, 135 high school districts, and 442 unit districts were used. Similarly the same number of school districts except in high school districts in 1974-75 were included. For the high school districts in 1974-75, 134 districts were employed. When income data was used, considerations of data validity required that a "near" population be used which consisted of only 326 elementary school districts, 101 high school districts, and 362 unit school districts in 1972-73. For 1973-74, 327 elementary districts, 99 high school districts, and 363 unit school districts were utilized. The number of elementary school districts in 1974-75

included were 326, of high school districts 98, and of unit districts, 364. The dropping of school districts in the income analysis did not greatly affect the percentage of students retained in the study. For example, in 1974-75, 89 per cent of the entire population of elementary students, 83 per cent of the high school students, and 86 per cent of the unit school district students were included. This is a reflection of the fact that income data validity problems were encountered much more in the small school districts of the state than in the larger school districts.

Results of the Evaluation Using Two Years Fiscal Data

The attached tables contain the results of applying the first three criteria to the first two years of the new allocation system. It should be stressed that the 1973 reforms in Illinois are phased in over a four-year period. Thus the results shown here are at funding levels which are only roughly at 25 per cent of formula "entitlement" in the first year and 50 per cent of formula "entitlement" in the second year. Readers must be referred to the longer USOE report and to other documents of the Illinois Office of Education for details.(39) The last criterion is applied to only the first year fiscal data since we had not completed analysis of this portion of the second year fiscal data at the time of this writing.

In table one-A it can be seen that the overall variation in state and local revenues per ADA have decreased between 1972-73 and 1974-75. However, this reduction of variation appears to have been greater in the first year of the reform than in the second year. In fact, in elementary districts the variation actually increased slightly from 1973-74 to 1974-75. Also with regard to operating tax rates in elementary districts there has been no overall reduction in variation between 1972-73 and 1974-75. However, the other two district classifications do show a reduction between 1972-73 and 1974-75. Again most of the reduction of variation was in the first year of the reform. Table one-A is based on model A of the permissible variance criterion. If the basis of evaluation is not model A, but rather model B, e.g., if the concern is only with the lower end of the expenditure distribution, then table one-B suggests that appreciable progress has been made toward lifting many of the students in Illinois toward the target level of $1,260. This is particularly true in high school districts where only 16 per cent of the students remained below the $1,260 figure in 1974-75. Table one-B does not enable one to say, however, how much of this effect can be attributed to the change in the grant-in-aid and how much can be attributed to local district effort. The evidence for attainment of the fiscal goals implicit in model B appears stronger than for the attainment of the fiscal goals in model A of the permissible variance criterion.

The results of the fiscal neutrality analysis are displayed in tables two-A, two-B, and two-C. In tables two-A and two-B are the Gini coefficients based first, on a property valuation per pupil specification of wealth, and then second, upon an income specification of wealth. The income data used is personal income from families and unrelated individuals as reported in the 1970 federal census of population and housing. Income data for this number of school districts has never previously been available in Illinois. For a discussion of the strengths and weaknesses of these federal census derived income data the reader is referred to the longer USOE report. It must suffice to record here that while there has been a movement for some time to get a line placed on the state income tax form to record the school district number of the taxpayer, as is presently done in the state of Kansas, no action has yet been taken on this matter in Illinois. Consequently individuals interested in income data for school districts must fall back on the 1970 census data as the second or third best measurement of income in the schools of Illinois. For some of the smaller districts in Illinois even this census income, while available, is not considered especially high in validity. For further details on this matter the reader is directed to the work of Vernon Pohlmann.(40) Of course, no matter how valid the income data may have been for 1969, when it was collected, it must be considered much less valid for 1975. What all this boils down to is that unless Illinois solves the problem of getting income

data from its own state income tax forms, any analysis in terms of district income must always remain open to some serious reservations.

If the "expanded" formulation of the fiscal neutrality criterion is used, that is, if students weighted by need (in this analysis title one weighted average daily attendance) is used, then tables two-A and two-B indicate that there has been a steady progress made toward fiscal neutrality from 1972-73 to 1974-75 regardless of whether income or property valuation is used as the wealth specification. The single exception is with regard to income per pupil in unit districts. A similar statement can be made for elementary and high school districts when the ADA count is used. The analysis for unit districts, however, reveals a curvilinear tendency where assessed valuations are concerned, and an actual movement away from fiscal neutrality when income per ADA was used. At first we found this perplexing but upon recalling the importance of the largest district in Illinois on the Gini Index, e.g., Chicago, we computed the value of the coefficient holding Chicago out of the unit school district distribution. The results are indicated in the last two rows of tables two-A and two-B. Withdrawing Chicago results in a clear progression toward fiscal neutrality.

To explore why the withdrawal of Chicago had this effect we ranked all unit school districts in terms of the wealth measurements used and then located Chicago in this rank ordering. The results are seen in table two-D. It is clear that in

terms of these "average" type measurements of wealth Chicago is not especially poor. But it is also true that Chicago has one of the highest concentrations of title one eligibles in Illinois. It is generally accepted that Chicago has some of the most serious slums and ghetto areas in the nation. The dilemma here has been noted by a number of investigations of the school finance situation of large urban school districts.(41) When measurements related to poverty concentrations are used, large cities appear much poorer than the state average. However, when "average" measurements of wealth are used, the central city districts appear wealthier than the state average. Basically we believe the source of this phenomenon lies in the nature of the wealth distributions within large urban school districts. These wealth distributions are highly skewed. It is true that there are large pockets of poverty in central city school districts, but it is equally true that there remain in those districts a number of very affluent individuals and families. The result is that any measurement of central tendency is not a fair description of the wealth situation in central cities. Our immediate problem in the Illinois evaluations was that the 1973 reform contained a weighting for concentrations of title one which tended to put fairly large sums of money into Chicago. Chicago's relatively high educational tax rate also helped to increase the flow of state funds after 1973. To the extent that we aided Chicago, however, to that same extent did the Gini values tend to move away from fiscal neutrality, since

Chicago ranked so high in the wealth specification that was used in the Gini coefficient calculations. The single exception to this, it will be recalled, is when assessed valuation per TWADA is used, and Chicagoans may be expected to argue that this is the most "valid" specification of school district wealth. To put the matter another way, central city educators will argue for the "expanded" interpretation of the fiscal neutrality concept discussed above. Their position will be that "poorness" can be measured only after differences in student educational needs have been taken into consideration when calculating per pupil wealth.

Table two-C displays the results of the Michelson regression approach to the concept of fiscal neutrality. The results based on property valuations, that is, the top half of the table, show a very consistent and steady trend toward increasing fiscal neutrality; e.g., progressively lower regression coefficients. As would be expected, taking Chicago in and out of the calculations does not have the effect on the regression coefficient that it does on the Gini Index. The same trend toward fiscal neutrality is shown when income data is used; however, such a trend is apparent only when 1974-75 data are added to the time series. We cannot at present account for the puzzling curvilinear nature of the income series, e.g., away from fiscal neutrality in 1973-74 and then back toward fiscal neutrality in 1974-75. This increases our apprehensions about the validity of the income data which we have previously

expressed. On the whole, however, the regression analysis does support the results of the analysis by Gini coefficients and leaves the general impression that progress has been made toward fiscal neutrality, especially if the property valuation specification of wealth is accepted.

Tables three-A and three-B display the data on the third criterion, "reward for effort," or alternately, "equal expenditure for equal effort." As mentioned previously, these models assume a constant linear slope throughout the entire length of the tax rate schedule, which appears an increasingly dubious assumption to us now. However, given this assumption, table three-B shows a steady and regular increase in "reward for effort" from 1972-73 to 1974-75 with regard to elementary districts and unit districts. The exception occurs in the high school districts. We believe this can be explained by the low ceiling of $1.05 placed on the Illinois DPE schedule for high school districts under the 1973 reforms. Many high school districts are already at or close to that figure and hence the "reward for effort" feature is greatly weakened. Table three-B gives basically the same impression, and here even the high school districts move closer to the criterion. The low values of the square of the product moment correlation are interesting. They probably reflect the fact that state aid in Illinois is still less than 50 per cent of the total funding of K-12 schools, and hence expenditures are still determined partially by local resources as shown previously in table two-C.

Table four displays a very small part of the data collected for the analysis by community type. Both the simple means of state aid per ADA and means based on weighting state aid by the number of students in a school district are given. Regardless of which measurement is used it is clear that the nine central city school districts of Illinois were greatly aided in the first year of the reform. The suburbs also fared rather well. This has led some critics of the 1973 reform to label it: "aid to the metropolitan areas." By contrast the rural districts of Illinois did not do well. Investigation of data not reproduced here indicates that this was a function of both (a) relatively low tax rates in the rural areas of Illinois, in particular in the very high assessment agricultural central portion of the state, and (b) lack of high concentrations of title one eligibles in some, though not all, rural areas. As this paper was being written a bill was introduced in the Illinois General Assembly which would include transportation costs in the effort or tax rate portion of the formula. It is given a good chance of passing and such a development will send more state aid to the rural areas. Based on the results of table four educators and legislators in Illinois can make a reasonable claim for having done at least something about the needs of education in urban areas. Whether <u>enough</u> has been done is a much more difficult question.

Conclusions, Limitations, and Speculation

The results of the analysis reported here using data from two fiscal years after the reform tend to support the analysis reported earlier this year which used only a single year's fiscal data. We conclude, therefore, as we did earlier, that the reforms of the summer of 1973 do seem to be moving the state of Illinois toward the four fiscal goals outlined in this paper. There are, of course, limitations on such a general finding. We continue to express concern about the validity of our income data; we caution that the grant-in-aid system is only 50 per cent funded, we remind the reader that the analysis does not include state categorical aids, nor does it include any federal funding. Finally we express the belief that DPE systems or "reward for effort" systems may well be slow in showing their main effects. One must allow time for districts to respond to the "reward for effort" aspects of such grants, and this may well be a matter of three to five years after the passage of such measures.

Nor do we wish to convey the impression that there are no problems with the system of allocation passed in 1973. We have already mentioned the difficulty of rural districts under such a system. As a parting shot we invite the readers' attention to table five, which contains evidence of a potentially troublesome relationship. In general the reformers did not anticipate the positive relationship shown in this table

between tax rate and income per pupil. This matter needs careful monitoring since there are a fair number of observers who believe that if DPE systems are allowed to operate for some time, it will be the wealthier districts that are able to pass the referenda, raise their rates, and hence earn more state funds than the poorer districts. The evidence of table two-B suggests that this has not happened as yet in Illinois after two years' experience with a DPE, or reward for effort structure. However, that does not preclude the possibility that it could happen at some later point in time. In other words Barro's ex ante concept of fiscal neutrality is simply not acceptable to many in Illinois, and therefore it is necessary to continue our ex post investigations.

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8. Communications on this matter can be addressed to William J. Wasson, Deputy Commissioner, Department of Elementary and Secondary Education, Jefferson City, Missouri, 65101.

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10. There is presently under way a study of special education funding in Illinois that may change this situation. Communications should be addressed to William P. McLure, Bureau of Research, College of Education, University of Illinois, Urbana.

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28. Professor Ramesh Chaudhari, Computer Services Division, Illinois State University, Normal, Illinois, 61761.

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39. See the citations in footnote #9.

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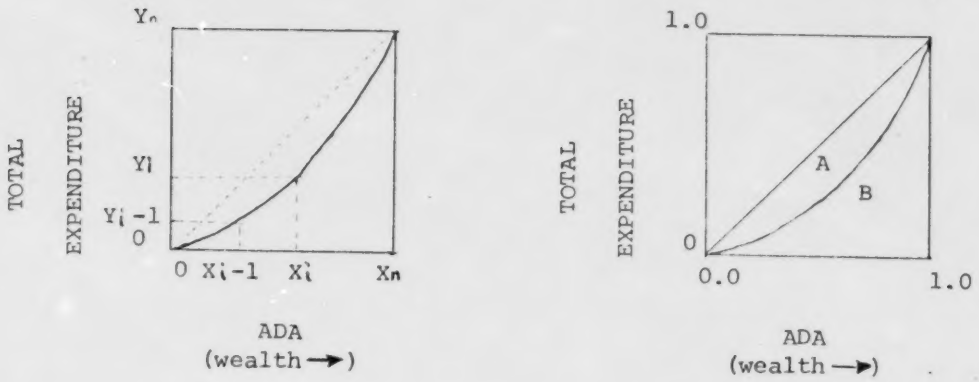
APPENDIX A

COMPUTATION OF GINI COEFFICIENT

The districts are sorted in ascending order of wealth per pupil. The cumulative proportions of pupils in the districts are represented by the horizontal axis and the cumulative proportions of total operating expenditures accounted for by these districts are represented by the



vertical axis. The curve thus plotted would be a straight line if the operating expenditures per pupil were the same in all districts. A sagging curve represents lesser expenditure in poorer districts. The measure of this inequality as defined by Gini Coefficient G is given by the formula:

$$G = \frac{\text{Area A}}{\text{Area (A+B)}}$$

or after further simplication

$$G = \frac{0{\cdot}5 - \text{Area B}}{0{\cdot}5}$$

$$= 1 - 2\text{Area B} \qquad (1)$$

Area B is the area under the curve and if n is the number of districts, and

X_i = cumulative proportion of ADA for the ith district

y_i = cumulative proportion of $ for the ith district

$$\text{Then Area B} = \sum_{i=1}^{n} \frac{(x_i - x_{i-1})\ (y_{i-1} + y_i)}{2}$$

$$\text{or } 2 \text{ Area B} = \sum_{i=1}^{n} (x_i y_{i-1} - x_{i-1} y_{i-1} + x_i y_i - x_{i-1} y_i)$$

$$= (x_i y_0 - x_0 y_0 + x_1 y_1 - x_0 y_1$$

$$+ x_2 y_1 - x_1 y_1 + x_2 y_2 - x_1 y_2$$

$$+ x_n y_{n-1} - x_{n-1} y_{n-1} + x_n y_n - x_{n-1} y_n)$$

$$= (x_2 y_1 - x_1 y_2) + (x_3 y_2 - x_2 y_3) + \ldots$$

$$+ (x_n y_{n-1} - x_{n-1} y_n) + x_n y_n$$

$$= \sum_{i=2}^{n} (x_i y_{i-1} - x_{i-1} y_i) + 1 \qquad (2)$$

$$= 1 - \sum_{i=2}^{n} (x_{i-1} y_i - x_i y_{i-1})$$

substituting the value of area B in eq 1

$$G = \sum_{i=2}^{n} (x_{i-1} y_i - x_i y_{i-1}) \qquad (3)$$

Appendix B

Initial Attempt at Separation of Disparity Effects

Tables A, B, and C contain the data which identify the following underlying effects: (1) tax capacity disparity effect, (2) tax variation effect, and (3) state aid distribution effect. These three effects are measured in terms of the Gini coefficient. The tax capacity is defined in terms of assessed valuation of property. The tax capacity disparity effect is measured by placing property assessed valuation on the vertical axis. ADA or TWADA is then placed on the horizontal axis (ranked by increasing property assessed valuation from left to right). Figure 1a is a display of the tax capacity disparity effect (G1). This can also be viewed as the disparity in local revenues with a constant tax rate. Figure 1b is a display of the local revenue disparity which is arrived at by placing local revenue (property assessed valuation times operational tax rate) on the vertical axis in the computation of the Gini coefficient (G2). The tax variation effect (G4) is then computed by subtracting G2 from G1. In figure 1c, state aid is added to the product of the tax rate times assessed valuation of property. Thus G3 displays the total estimated revenue disparity. The state aid distribution

effect (G5) is then calculated by subtracting G3 from G2. Figure 1 indicates the interrelationship among figures 1a, 1b, and 1c. G4 is the symbol to indicate tax variation effect, while G5 demonstrates the state aid distribution effect on the movement toward fiscal neutrality.

Table B provides the data on the tax variation effect. Where the local revenue per pupil is used, the tax variation effect on the movement toward the goal of fiscal neutrality is not very pronounced, compared with the tax capacity disparity effect in table A. The local revenue disparity in table B-1 is more affected by property assessed valuation than it is by tax rate. Table B-1 displays the Gini coefficient of local revenue disparity which sums the tax variation disparity and capacity disparity effects. For the dual districts, the local revenue disparity is decreasing. Local revenue disparity, however, is slightly increasing for the unit school districts.

A number of factors affect the change of local revenue disparity. Sum of these are: (1) consolidation of school districts, (2) changing enrollments, (3) commercial and industrial locations and relocations, and (4) changing tax rates. If tax capacity disparity could be reduced by the first three items then the state's tax burden in moving toward a condition of fiscal neutrality would be reduced.

Table C contains the data concerning the state aid distribution effect on the movement toward the criterion of fiscal neutrality. These data show that the state aid

distribution effect is increasing each year. This indicates that the state funding system is putting more monies into the property valuation poorer school districts which then moves the state closer to the goal of fiscal neutrality. It should be noted that the analysis contained in this appendix is based solely on the use of property valuations as a measurement of wealth.

From tables A, B, B-1, and C, it is clear that local revenue disparity is more affected by the disparity of property assessed valuation than by the tax rate. The distribution of state aid offsets to some extent the effects of local revenue disparity. However, since the coefficients in tables 2A and 2B in the text are not zero, Illinois has not achieved, as yet, a goal of absolute fiscal neutrality.

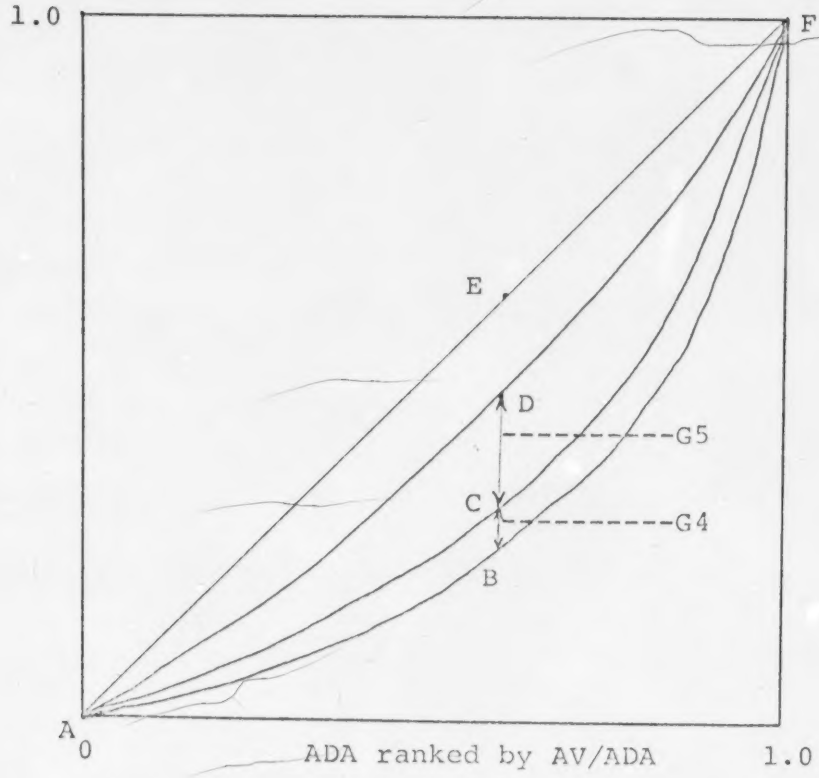
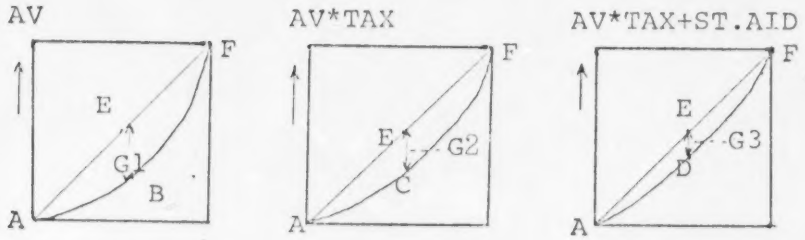


FIG. 1



1a 1b 1c

DISPARITY EFFECTS AS MEASURED BY GINI COEFFICIENTS:

G1 : Disparity effect of Assessed Valuation (Curve ABF)

G2 : Disparity effect of Local Revenue (curve ACF)

G3 : Disparity effect of State+Local revenue (curve ADF)

G4 = G1 - G2 : Tax Rate Variation effect

G5 = G2 - G3 : State Aid Distribution effect.

TABLE A

TAX CAPACITY DISPARITY EFFECT

	ADA			TWADA		
	72-73	73-74	74-75	72-73	73-74	74-75
Elem.	0.2701	0.2666	0.2648	0.2703	0.2665	0.2702
High	0.1689	0.1688	0.1663	0.1687	0.1683	0.1677
Unit	0.1564	0.1585	0.1483	0.1154	0.1162	0.1482
Unit W/C	0.1991	0.1989	0.1985	0.2116	0.2104	0.2114

TABLE B

TAX VARIATION EFFECT

	ADA			TWADA		
	72-73	73-74	74-75	72-73	73-74	74-75
Elem.	0.0044	0.0027	0.0081	0.0038	0.0019	0.0073
High	0.0164	0.0153	0.0173	0.0159	0.0143	0.0164
Unit	0.0602	0.0617	0.0028	0.0269	0.0274	0.0437
Unit W/C	0.0366	0.0364	0.0330	0.0359	0.0338	0.0312

TABIE B-1

LOCAL REVENUE DISPARITY

	ADA			TWADA		
	72-73	73-74	74-75	72-73	73-74	74-75
Elem.	0.2657	0.2639	0.2567	0.2665	0.2646	0.2629
High	0.1525	0.1535	0.1490	0.1528	0.1540	0.1513
Unit	0.0962	0.0968	0.1455	0.0885	0.0888	0.1045
Unit W/C	0.1625	0.1625	0.1655	0.1757	0.1766	0.1802

TABLE C

STATE AID DISTRIBUTION EFFECT

	ADA			TWADA		
	72-73	73-74	74-75	72-73	73-74	74-75
Elem.	0.1718	0.1816	0.1910	0.1670	0.1798	0.1902
High	0.0596	0.0720	0.0756	0.0567	0.0693	0.0757
Unit	0.0394	0.0352	0.0955	0.0540	0.0623	0.0902
Unit W/C	0.1264	0.1383	0.1544	0.1251	0.1379	0.1534

TABLE ONE-A

PERMISSIBLE VARIANCE CRITERION

	Estimated State Aid and Local Revenue Per ADA			Operating Tax Rate		
	1972-73	1973-74	1974-75	1972-73	1973-74	1974-75
Elem.	28.729	26.899	27.553	25.000	24.203	25.000
High	27.801	24.992	23.842	23.809	22.000	22.875
Unit	14.807	13.492	13.344	15.596	14.847	14.655

TABLE ONE-B

MODIFIED McLOONE INDEX
BASED ON $1,260

Type	Index	Per Cent of Districts	Average Deviation to $1,260	Per Cent of Students
		1972-1973		
Elem.	0.68694	463	$394.43	91.45
High	0.85638	88	180.95	45.82
Unit	0.79594	431	257.11	99.81
		1973-1974		
Elem.	0.76526	419	$295.75	83.30
High	0.90143	70	124.20	35.43
Unit	0.79795	421	254.57	62.84
		1974-1975		
Elem.	0.81656	407	$231.12	80.67
High	0.91580	42	106.10	16.11
Unit	0.82272	409	223.36	58.47

*ADA

TABLE TWO-A

FISCAL NEUTRALITY CRITERION USING
PROPERTY VALUATION PER PUPIL

	Assessed Valuation Per ADA			Assessed Valuation Per TWADA		
	72-73	73-74	74-75	72-73	73-74	74-75
Elem.	0.0939	0.0823	0.0657	0.0995	0.0848	0.0727
High	0.0929	0.0815	0.0734	0.0961	0.0844	0.0756
Unit	0.0578	0.0616	0.0500	0.0345	0.0265	0.0143
Unit W/C	0.0361	0.0242	0.0111	0.0506	0.0387	0.0268

TABLE TWO-B

FISCAL NEUTRALITY CRITERION
USING INCOME PER PUPIL

	Income Per ADA			Income Per TWADA		
	72-73	73-74	74-75	72-73	73-74	74-75
Elem.	0.0931	0.0812	0.0693	0.0959	0.0785	0.0711
High	0.0975	0.0787	0.0659	0.1005	0.0821	0.0697
Unit	0.0685	0.0820	0.0922	0.0139	0.0179	0.0236
Unit W/C	0.0305	0.0259	0.0181	0.0440	0.0370	0.0294

TABLE TWO-C

FISCAL NEUTRALITY IN TERMS OF TWO WEALTH SPECIFICATIONS USING THE MICHELSON REGRESSION APPROACH

	72-73	73-74	74-75	72-73	73-74	74-75
Elem.	0.26999	0.26465	0.22554	0.27679	0.24592	0.23293
High	0.44007	0.39142	0.33920	0.44843	0.39949	0.34834
Unit	0.19186	0.15914	0.10991	0.21693	0.17640	0.13478
Unit W/C	0.19138	0.15850	0.10937	0.21691	0.17642	0.13493
	Log Estimated Revenue/ADA = a + b LOGAV/ADA			Log Estimated Revenue/TWADA = a + b LOGAV/TWADA		
	72-73	73-74	74-75	72-73	73-74	74-75
Elem.	0.30885	0.31464	0.22216	0.31991	0.31165	0.23250
High	0.12443	0.14602	0.12548	0.13539	0.16639	0.14900
Unit	0.10385	0.12922	0.07624	0.16484	0.16530	0.09290
Unit W/C	0.09739	0.12100	0.07202	0.16649	0.16621	0.09264
	Log Estimated Revenue/ADA = a + b LOG IN/ADA			Log Estimated Revenue/TWADA = a + b LOG IN/TWADA		

TABLE TWO-D

WEALTH OF CHICAGO
(1974-75)

Variables	Rank	Total Units
Income Per ADA	8	364
Income Per TWADA	22	364
Property Valuation Per ADA	117	442
Property Valuation Per TWADA	299	442

TABLE THREE-A

REWARD FOR EFFORT
USING NO TRANSFORMATION

	1972-73	1973-74	1974-75
Elem.	17.733	23.733	26.930
High	32.647	32.381	36.556
Unit	12.010	16.471	22.947

Estimated Revenue/ADA = a + b Tax Rate

REWARD FOR EFFORT
USING LOG TRANSFORMATION

	1972-73	1973-74	1974-75
Elem.	0.2526	0.3137	0.3922
High	0.3570	0.3260	0.3765
Unit	0.2658	0.3628	0.4914

Log Estimated Revenue/ADA
= a + b Log Tax Rate

TABLE THREE-B

EQUAL EXPENDITURE FOR EQUAL EFFORT CRITERION
CORRELATION COEFFICIENT SQUARED (R^2)

	1973-73	1973-74	1974-75
Elem.	0.0745	0.1201	0.15262
High	0.1083	0.0970	0.13299
Unit	0.1048	0.1692	0.31866

*Using no transformation. Estimated revenue/ADA = a + b (tax rate.

TABLE FOUR

STATE AID PER ADA BY COMMUNITY TYPE
UNIT DISTRICTS

Community Type	Weighted Means		Ratio	Unweighted Means		Ratio
	72-73	73-74	74-75	72-73	73-74	74-75
Central City	$414	$521	1.258	$426	$503	1.181
Independent City	412	473	1.148	412	474	1.150
High Growth Suburbs	435	502	1.161	397	455	1.146
Low Growth Suburbs	425	509	1.198	356	412	1.157
Rural	387	442	1.142	356	405	1.138

TABLE FIVE

WEALTH AND TAX EFFORT
SIMPLE LINEAR RELATIONSHIPS
UNIT DISTRICTS

Variables	1972-73	1973-74
Tax Rate and Income/ADA	+.2072	+.2363
Tax Rate and Income/TWADA	+.1850	+.2221
Tax Rate and Property Av./ADA	-.3509	-.3693
Tax Rate and Property Av./TWADA	-.3580	-.3759